CLAIMS

1. A protective covering system resistant to penetration of an object, comprising:

a plurality of matrix layers; and

a plurality of protective elements, each of at least two of the plurality of matrix layers having a plurality of said protective elements attached to the matrix layer in a uniform pattern, the protective elements being constructed and configured in respective matrix layers to resist penetration of an object upon contact of the object with said protective elements.

2. A protective covering system according to claim 1, resistant to penetration of said objects having an energy of at least 25 joules presenting an impact area of at most 1×10^{-6} square inches.

3. A protective covering system according to claim 1, at least one said matrix layer having a plurality of fibers.

4. A protective covering system according to claim 1, at least some of said protective elements comprising metallic staples secured to at least one said matrix layer.

5. A protective covering system according to claim 1, at least some of said protective elements comprising wire elements woven into at least one said matrix layer.

6. A protective covering system according to claim 1, at least one said matrix layer having flexibility to bend 180 degrees in at least one direction with a radius of not more than approximately 0.5 inches

7. A protective covering system according to claim 1, wherein each matrix layer has an areal density of at most 1.5 lbs. per square foot.

8. A protective covering system according to claim 1, having an areal density of at most 2 lbs. per square foot.

9. A protective covering system according to claim 1, wherein the protective elements are attached to each matrix layer and the matrix layers oriented so that the protective elements provide a protective coverage area of less than 90% of total surface area of said system.

10. A protective covering system according to claim 1, wherein the protective elements are attached to each matrix layer and the matrix layers oriented so that the protective elements provide a protective coverage area of approximately 40% to 90% of total surface area of said system.

11. A protective covering system according to claim 1, wherein the protective elements are interconnected with each other only through respective said matrix layers, and are not directly interconnected with each other.

12. A protective covering system according to claim 1, wherein at least one said matrix layer is a high cover fabric that is resistant to round object penetration.

13. A protective covering system according to claim 1, further comprising at least one ballistic catching layer of woven fabric.

14. A protective covering system according to claim 1, wherein at least one said matrix layer is shrunken to adjust the spacing between the protective elements.

15. A protective covering system resistant to penetration of an object, comprising:

a plurality of matrix layers; and

a plurality of protective elements, each of at least two of the plurality of matrix layers having a plurality of said protective elements attached to the matrix layer in a uniform pattern, the protective elements being constructed and configured in respective matrix layers to resist penetration of an object upon contact of the object with said

protective elements, at least one said matrix layer having a plurality of fibers, at least some of said protective elements comprising metallic staples secured to at least one said matrix layer, at least one said matrix layer having flexibility to bend 180 degrees in at least one direction with a radius of not more than approximately 0.5 inches, wherein each matrix layer has an areal density of at most 1.5 lbs. per square foot, and wherein the protective elements are attached to each matrix layer and the matrix layers oriented so that the protective elements provide a protective coverage area of less than 90% of total surface area of said system.

16. A protective covering system according to claim 15, said system being resistant to penetration of said objects having an energy of at least 25 joules presenting an impact area of at most 1 x 10^{-6} square inches.

17. A protective covering system according to claim 15, wherein the protective elements are attached to each matrix layer and the matrix layers oriented so that the protective elements provide a protective coverage area of approximately 40% to 90% of total surface area of said system, and said system has an areal density of at most 2 lbs. per square foot.

18. A protective covering system resistant to penetration of an object, comprising:

a plurality of matrix layers; and

a plurality of protective elements, each of at least two of the plurality of matrix layers having a plurality of said protective elements attached to the matrix layer in a uniform pattern, the protective elements being constructed and configured in respective matrix layers to resist penetration of an object upon contact of the object with said protective elements, at least one said matrix layer having a plurality of fibers, at least some of said protective elements comprising wire elements woven into at least one said matrix layer, wherein the protective elements are attached to each matrix layer and the matrix layers oriented so that the protective elements provide a protective coverage area of less than 90% of total surface area of said system, and wherein each matrix layer has an areal density of at most 1.5 lbs. per square foot.

19. A protective covering system according to claim 18, wherein the protective elements are attached to each matrix layer and the matrix layers oriented so that the protective elements provide a protective coverage area of approximately 40% to 90% of total surface area of said system, at least one said matrix layer having flexibility to bend 180 degrees in at least one direction with a radius of not more than approximately 0.5 inches, said system having an areal density of at most 2 lbs. per square foot.

20. A protective covering system according to claim 18, said system being resistant to penetration of said objects having an energy of at least 25 joules presenting an impact area of at most 1×10^{-6} square inches.